

Bridging Pathways:

The Synergy of STEAM and CTE in High Schools



Presenters



Emily Czarnecki NCIDQ

Principal, JCJ Architecture

- 28 years of experience, specializing in design for educational environments
- Lead Interior Designer for the new New Fairfield High School
- **Sharing insight on**
- Design Strategies for Integration of core academics and Career Technical Programs
- Involving teachers and staff in workshops to become fully engaged in environment setting possibilities



James D'Amico

Principal, New Fairfield High School

- 25 Years as a Teacher and Administrator
- **Sharing insight on:**
- Visioning for Teaching and Learning influencing school design
- Reimagining School Culture
- Expansion of Career Technical Programs within the new facility

Session Learning Objectives

1. How adaptability in design can pave the way for creative integration of new technologies and programs that pique the interest of students through the thoughtful design of program-aligned space that meets their interests and needs.
2. How the selected furnishings in the commons, learning neighborhoods and specialized classrooms has increased a facilities ability to adapt to changes, improve student engagement, diminish absenteeism, and support agile STEAM and career prep environments.
3. How to build interest at the primary school level to help grow and anticipate new programs at secondary education facilities.
4. How post occupancy and exploratory data results influence administrative decisions in curriculum, space utilization and supporting personalized learning combined with career technical education for the future

Project Background and Context



New Fairfield High School: Project Background

- Conjoined High School and Middle School
- Existing 180,000 sf. High School constructed in the 1970s
- Cited by NEASC for ADA non-compliance and code violations, significant infrastructure deficiencies and insufficient support for educational program
- Facility assessment study found the building at the end of its useful life
- State and local approvals for construction of new school on the existing site

Existing Educational Environment

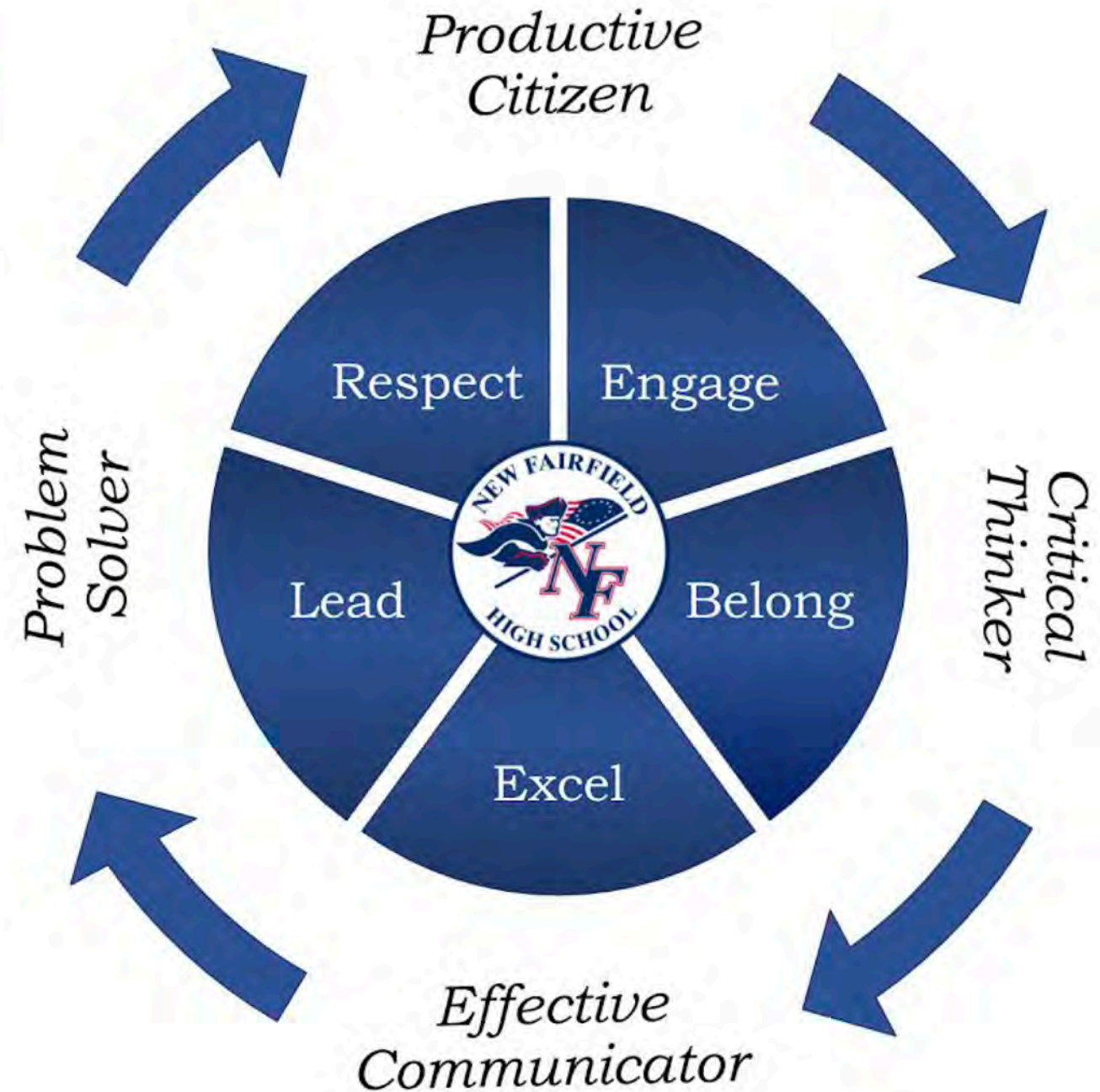
New Fairfield High School

MISSION STATEMENT

New Fairfield High School strives to provide a safe educational environment in which students *respect* the right for all to become *engaged* learners and responsible citizens who *belong, excel and lead* within a diverse society and changing world.

CORE VALUES & BELIEFS STATEMENT

New Fairfield High School is committed to all students achieving high academic standards and personal wellness, enabling continuous growth through authentic, flexible pathways. By prioritizing connectedness and compassion, we empower all members of our learning community to take ownership of our individual and collective development as we foster the *Attributes of the Graduate*.



Existing Educational Environment

Starts with the Vision of a Graduate

KNOWLEDGEABLE SCHOLARS



Pursue their interests and curiosities while developing a depth of background knowledge in all of the core academic domains as well as in life skills such as financial literacy, that they can use to solve problems and succeed in life.

TALENTED COMMUNICATORS

Read, write, listen, speak, create and view skillfully, critically and confidently. They can adapt their style and message for a variety of purposes, situations and audiences. As a result, they have strong relationship skills and can collaborate well. They can manage conflict confidently and respectfully.



CRITICAL & CREATIVE THINKERS



Access, evaluate and apply information to solve problems, pursue their curiosities and make decisions. They grow their creativity through experiences within the fine and performing arts which will further support their ability to think critically and creatively.



ENGAGED GLOBAL CITIZENS

Learn about the history of their local community, our country and other countries around the world to understand the value and unique principles of our American democracy. They learn what other cultures are like, so that they can understand, respect and embrace diversity, be socially aware, be kind, compassionate, empathetic and respectful. They obtain information from multiple, reliable sources and use it to be active, civic-minded participants within and beyond their community.



SELF-DETERMINED & SELF-RELIANT INDIVIDUALS

Set goals, persevere, and reflect as they learn to understand and regulate their emotions and reactions, which will foster their overall health, wellness and mindfulness. Through this they will become intentional, resilient, independent and most importantly, self-reliant.

Planning & Design



New Fairfield High School: Challenges within the Existing Building

- Shared building with Middle School limited flexibility
- Career Technical, Art and Music Programs inadequately sized and displaced in building
- Numerous interior educational spaces with no natural daylight
- Outdated Equipment and Technology to support the advancement of CTE and STEAM Programs
- Departmental Model isolated programs with few opportunities for collaboration.



Project Goals & Priorities

716 student population for Grades 9-12

- Remedy Failure of Facility to support program delivery
- Create an environment in which students can have greater agency
- Learning spaces that are flexible and adaptable to current and future needs
- Integrate CTE and STEAM programs within General Academics
- Move away from Departmental Model into a more efficient collaborative model
- Inclusive and differentiated spaces to appeal to different modalities of learning and support student well-being

Guiding Principles



**BUILD
COMMUNITY**



Guiding Principles



FOSTER COLLABORATION



Guiding Principles



PUT **LEARNING**
ON DISPLAY

Career Technical Education Programs

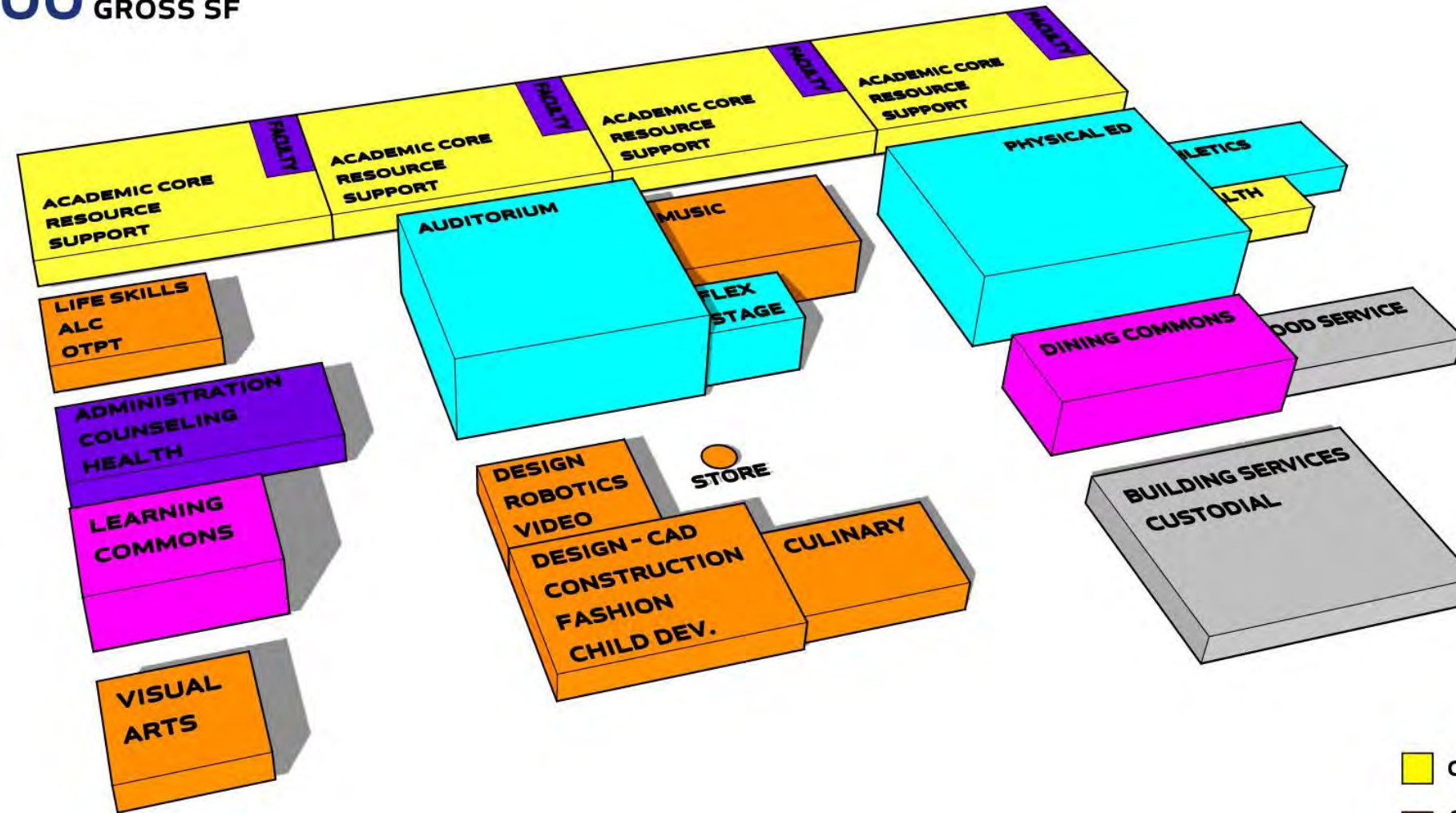
2018 - 2019 Programs

- CAD/Architectural Design
- Video Production Lab
- Robotics, Engineering, Energy, & Transportation
- Stagecraft Manufacturing & Construction
- Culinary Arts and Hospitality
- Fashion and Costume Design
- Child Development
- Business & Marketing



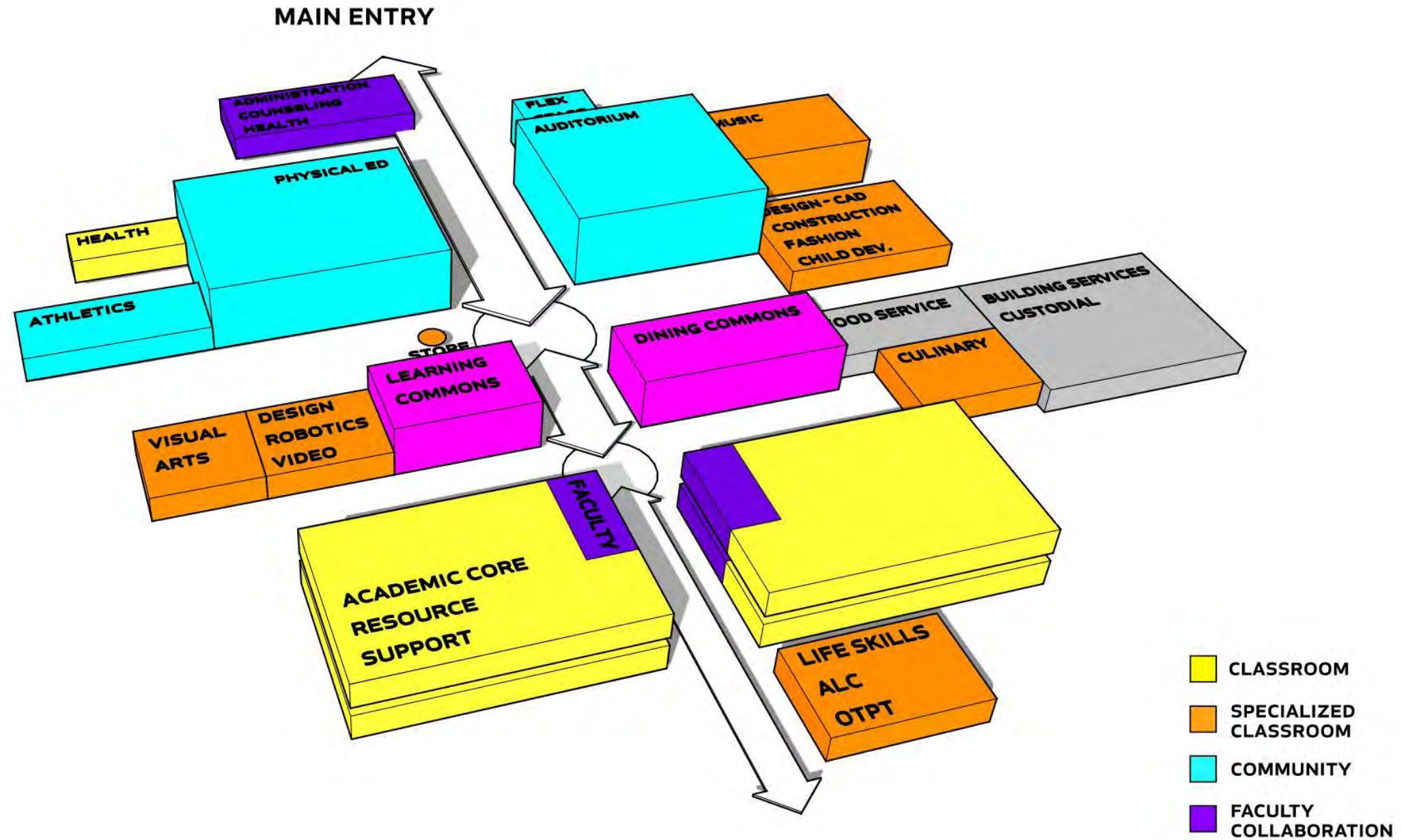
Graphic Diagram

143,000 GROSS SF

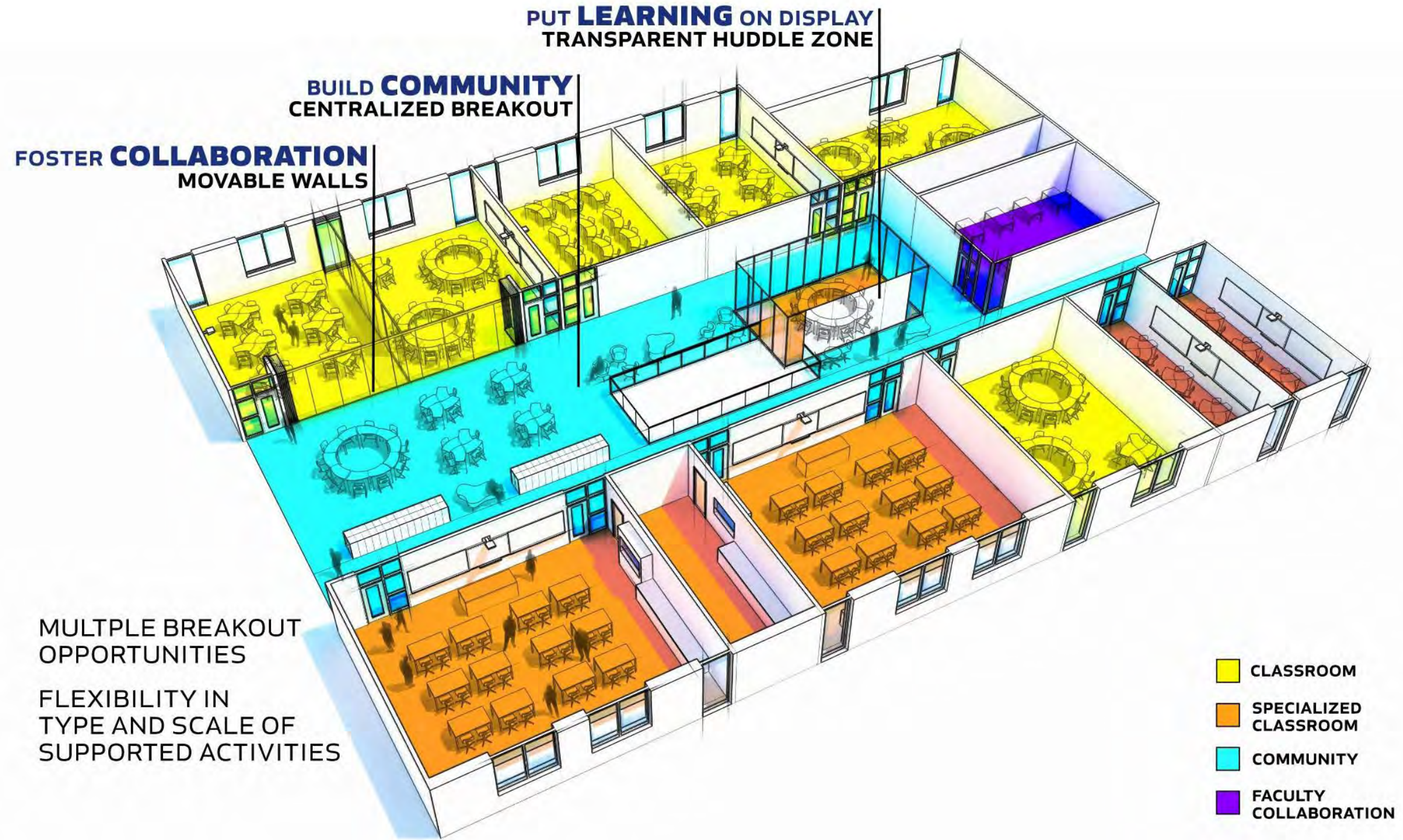


- CLASSROOM
- SPECIALIZED CLASSROOM
- COMMUNITY
- FACULTY COLLABORATION

Graphic Diagram Adjacencies



Learning Neighborhoods



New Plan / Organization

- COMMUNITY
- COMMONS
- CLASSROOM
- SPECIALTY
- FACULTY & STAFF



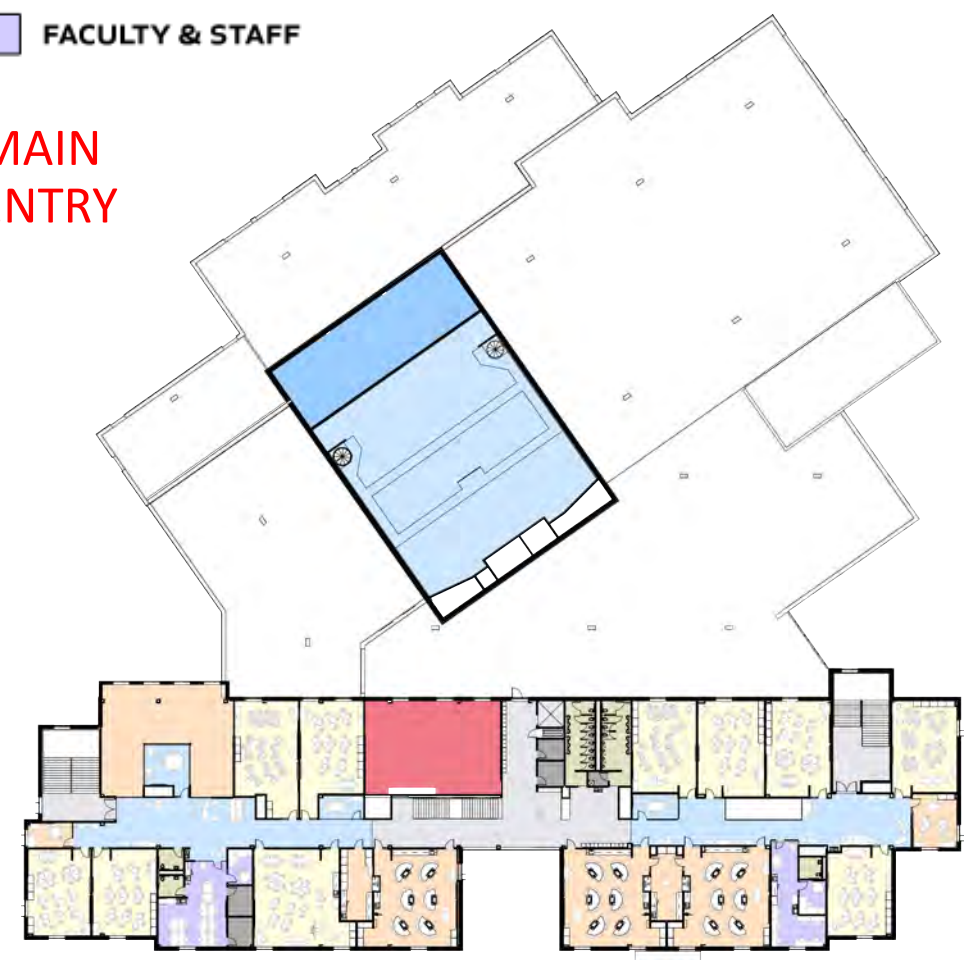
FIRST FLOOR

SECONDARY ENTRY



SECOND FLOOR

MAIN ENTRY



THIRD FLOOR

New Plan / Organization

- COMMUNITY
- COMMONS
- CLASSROOM
- SPECIALTY
- FACULTY & STAFF



Second Floor

- Visual and Physical Connections between newly created MAC Lab with Video Production/Media Lab, Learning Commons and Art Studio
- Inclusion of Digital Music Program with new Technology and Furniture
- Learning Neighborhoods support extended learning for both academic, CTE and the Arts





Video Production/ Media Lab



First Floor

- Robotics Connected with Dining Commons to expand space needs
- Culinary and Events Center adjacent to Dining Kitchen for shared resources
- Child Development located at secondary entry for ease of child drop-off / Pick up



Culinary Arts and Event Center



Fashion and Interior Design Lab



Woodworking and Construction Lab



Dining Commons View to Engineering



Engineering Lab



Engineering Lab: Focus on Adaptability

- Initial Vision for this space was unrealized during programming.
- Elements such as plumbing, overhead power, fume hood, and abundant writable surfaces allow for evolving programs and utilization
- Folding glass wall puts learning on display and allows for expanded exploration into Dining Commons
- Direct Connection with CAD/Design Lab for Co-teaching
- Opportunities to incorporate science elements



Furniture Integration



Attendance at Furniture Shows

**What we learned –
how the show helped clarify ideas and
shaped thinking moving forward...**

- Mobility is important for furnishings
- Durability and cleanability of finishes to be considered
- Commons Areas should include a variety of options
- Decision to bring in trial environments and gather input from students and teachers

Trial Environments: Test and Build Consensus

The Plan

- Multiple manufacturer designs at various intervals
- Set up in central Media Center location for greater visibility
- Faculty and student evaluation
- Surveys to gather feedback and inform the design

What we hoped would happen

- Daily activities utilizing the furniture
- Students to use during study hall, before and after school
- Teachers to move regular classes to the test furniture area

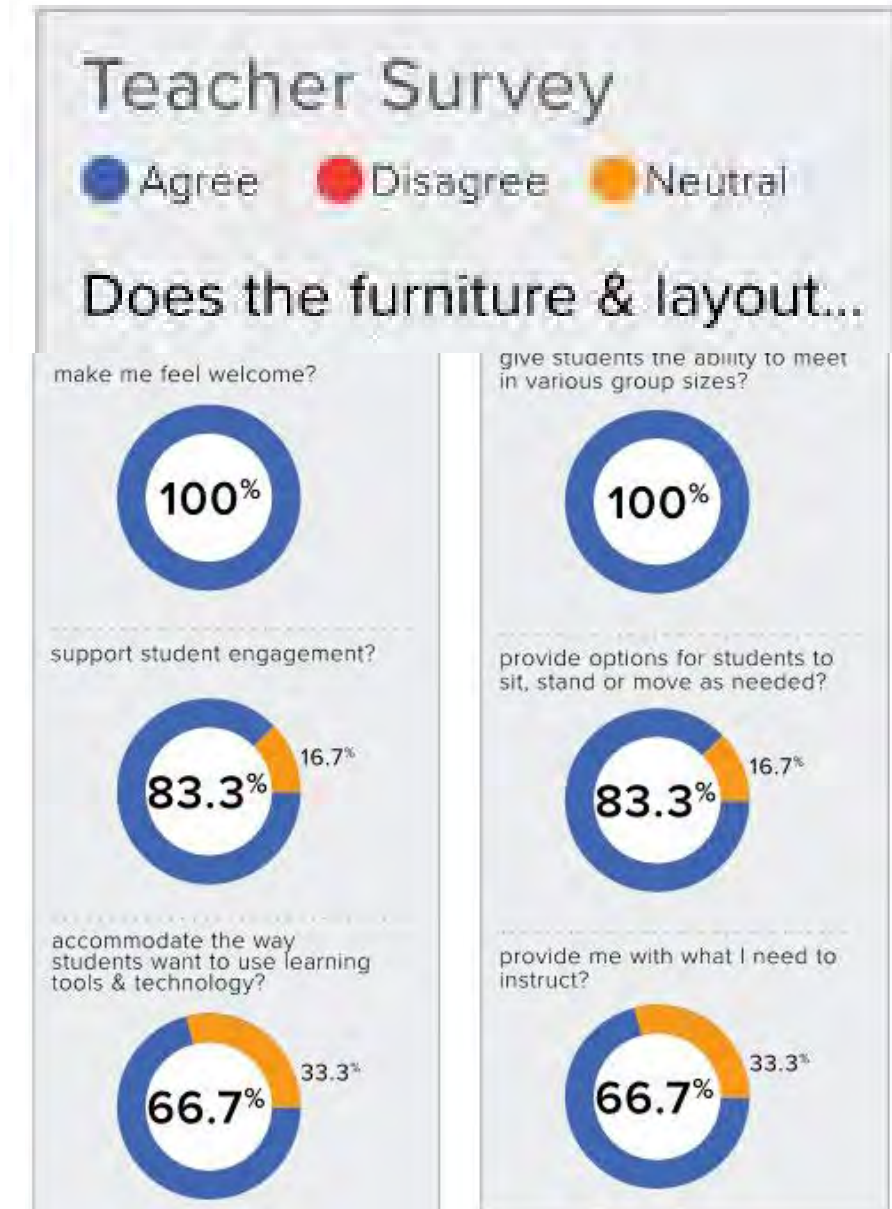
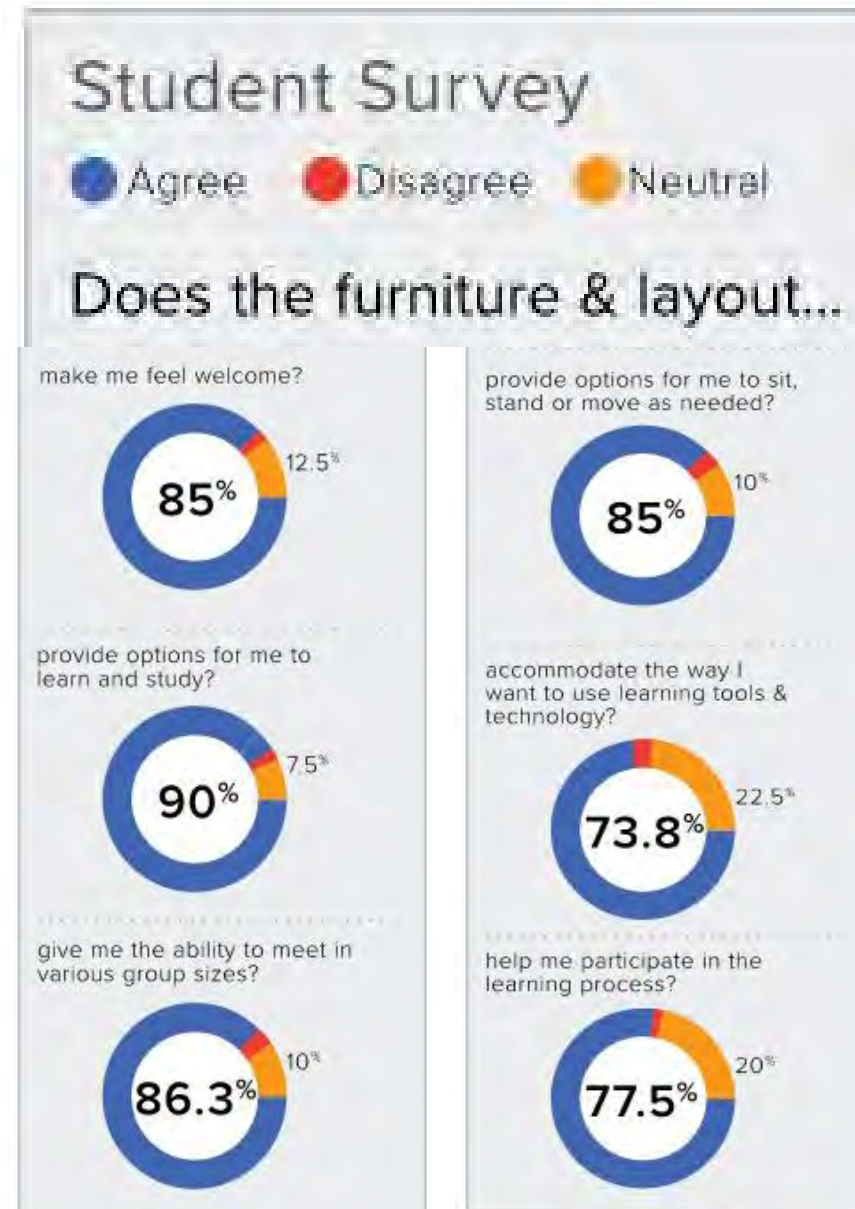


Trial Environments: Student Experience



Trial Environments: What we learned

- Students loved the ability to stand at high top tables
- Looking for more workspace
- Adjustability and mobility were high priorities
- Whiteboard tabletops were a hit
- Differentiated seating was ranked high



Trial Environments: Survey Feedback

Student Comments (Seating and Tables)

“I like the Wave and Ruckus Stools and the high tables. It was a nice change.”

“The C-tables are too small.”

“I like the higher desks, because they are also larger which allows more room for all of our materials during class.”

“The sizes of the chairs accommodate all different sizes of people. I’m really glad that the furniture is open and appealing to anyone.”

“It was nice being able to sit around others on higher tables and move around easier.”

“The Ricochet Stool really helped my focus when I was reading. I have ADHD and moving around helps me focus.”

“The MyPlace Lounge Seating would be a really nice addition to classrooms, especially English class, which includes more conversation, reading and writing.”

“I like the larger tables. They allow enough space when working on a group project.”

Trial Environments: Survey Feedback

Teacher Comments (Seating)

“I like how the Ruckus Chair allowed the students to sit in different positions.”

“The Ricochet Stools are very different than the seats the students are accustomed to. Students were more distracted by them than the other seating options.”

“The variety of chair styles allowed the students to change their learning environment by selecting a different seat on different days.”

“Students LOVED the different ways to use the stools.”

Teacher Comments (Tables)

“I love the adjustable sit-to-stand Ruckus Desk; however, I’m not a fan of the wheelbarrow design and would prefer all wheels.”

“I would like more whiteboard surfaces for the students to work on.”

“I liked the different heights for sit-to-stand options. I really liked the teacher’s standing desk.”

Furniture Selections: Goals & Priorities

- Variety of furniture types to allow student choice
- Learning neighborhoods to be customized to support adjacent classrooms
- Various height workspaces
- Agile choices that allow quick changes to layout relative to activities
- Comfort and ergonomics
- Integrated technology



Furniture Selections: Commons at the Center



Learning on Display Hub of student activity

- Bring gatherings (food), presentations, academics, arts, athletics and more together

Community Center Choice

- Seating
- Use of space

Furniture Selections: Learning Neighborhoods

Diverse spaces

- Collaboration
- Individualized
- Classroom & CTE extension

Student choice & freedom

- Culture of Responsibility



Community

- Faculty & Students together
- Visibility

Furniture Selections: Huddle Spaces



Visible in the “Neighborhood”

Instruction

Small Groups

- Student sign-up
- Classroom extension

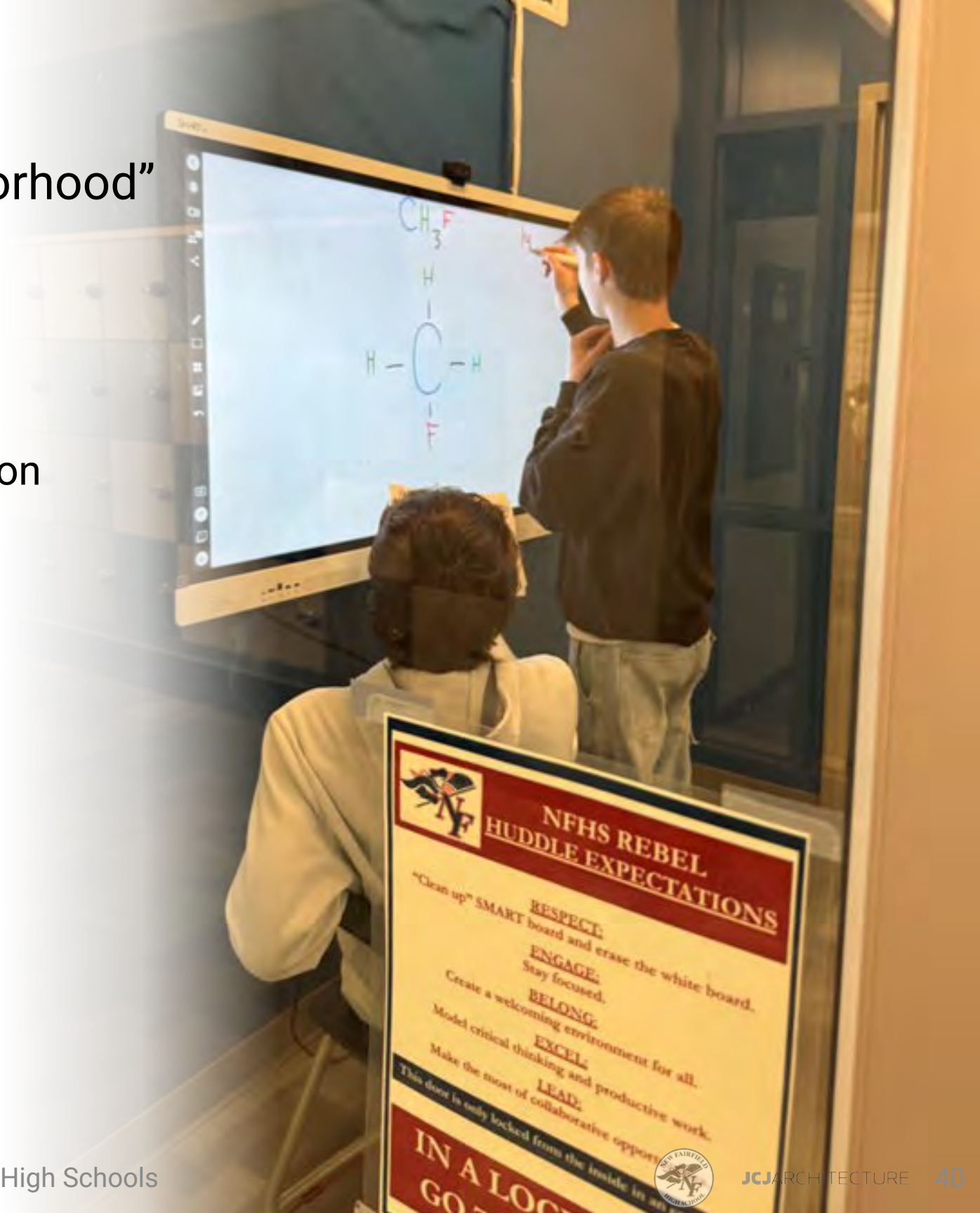
Conferences

PL Groups

Clubs

After School

Move your class!

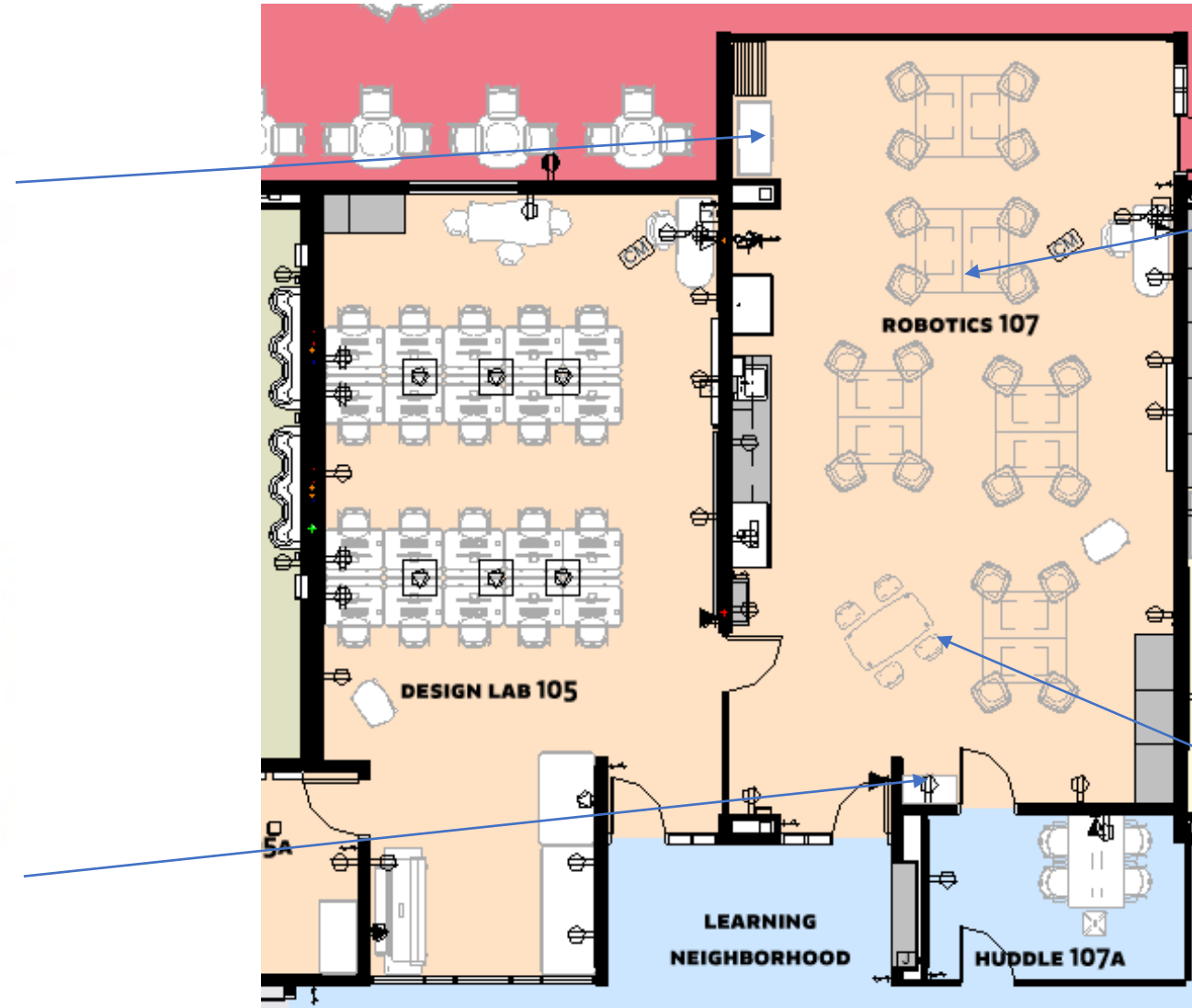


Furniture Selections Case Study: Engineering Lab

- Mobile Furnishings provides open space for Vex Field and robotics competition
- Mobile Storage cabinets limits built-ins
- Smaller two-person standing height table with personalized storage allows for agility



Furniture Selections Case Study: Engineering Lab



Feeder Programs at the Primary Level



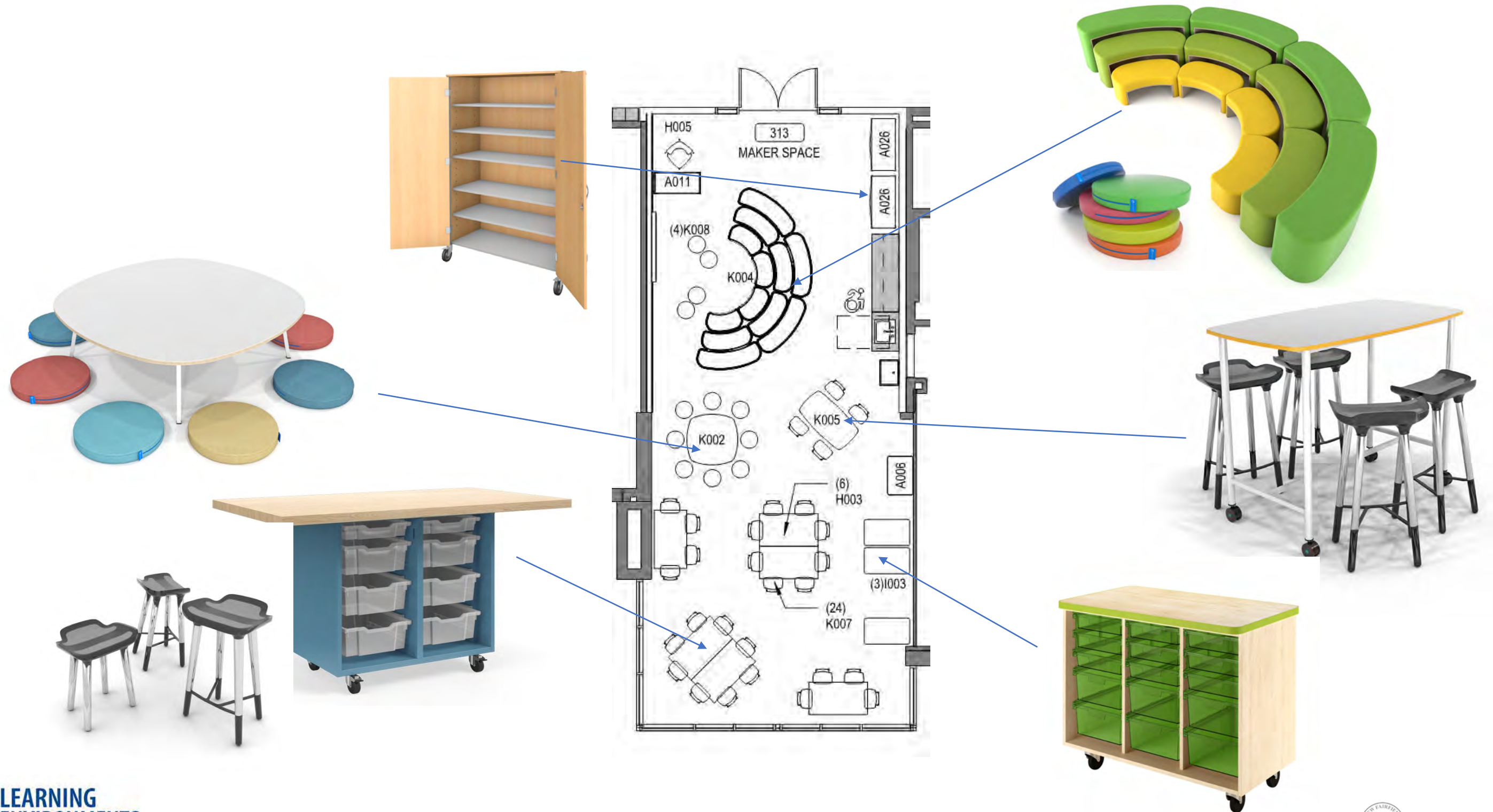
Elementary School Innovation Lab

Adaptability that supports:

- Scaled Furniture for Grades K-5
- Agile Furnishings provide easy transformations
- Mobile Storage limits built-ins
- Presentation and Sharing Area
- Video Production/ Green Screen Area for morning announcements and TV Club
- Introduction to Robotics
- Aquaculture and Plant Life
- 3D Modeling and Printing
- Before and After School Programs



Furniture Selections: Elementary School Innovation Lab



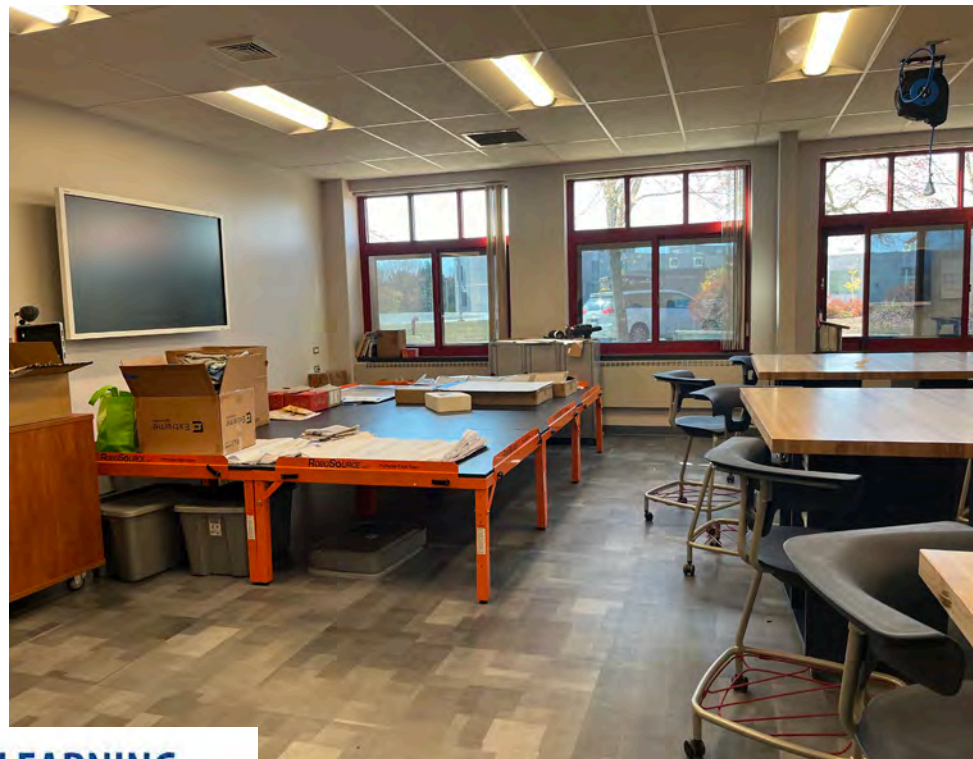
Middle School STEAM Exploration Lab

Adaptability that supports:

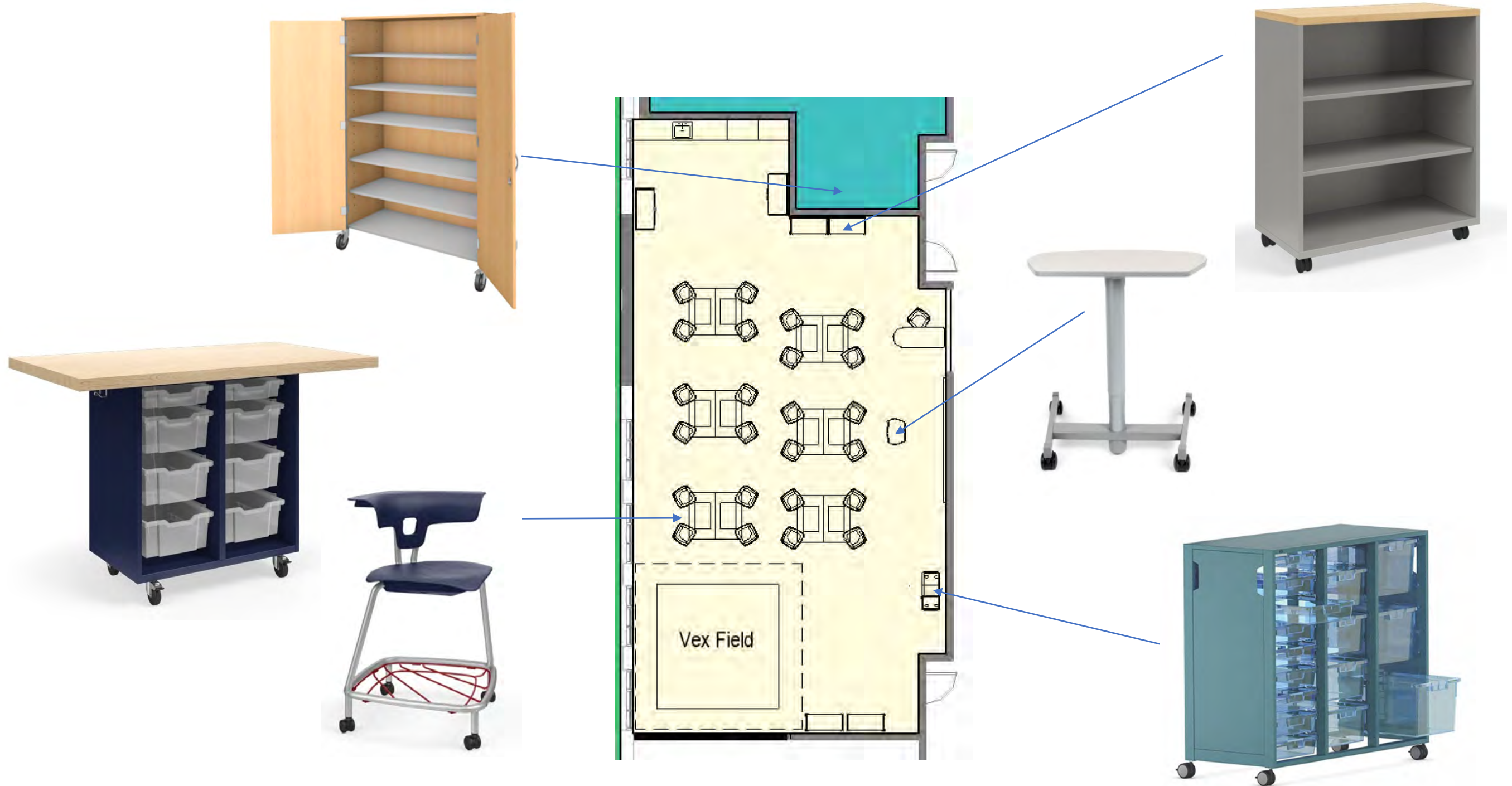
- Furnishings similar to high school space
- Agile Furnishings provide easy transformations
- Mobile Storage limits built-ins
- Centrally Located next to Art and Media Center
- Science, Technology, Engineering, Art, and Mathematics
- Vex Robotics Area
- 3D Modeling and Printing
- Access to power



Middle School STEAM Exploration Lab



Furniture Selections: Middle School STEAM Exploration Lab



Post-Occupancy Exploratory Study



Pre-Occupancy Training

- Teacher training workshops
- Documenting goals for teacher development, educational environment and student experience
- Coalesce around culture of continuous training and development
- Demonstrations and tools to assist both teachers and students



Mid-Year 1 Results, Anticipated ROI

So far:

- Increased energy around class time
- Unexpected excitement from teachers about learning neighborhoods
- Fewer undesirable gatherings in hallways and bathrooms
- More students eating in the dining area

What's up next:

- More teacher experience with sharing/utilizing flexible spaces
- Balancing student and teacher decision-making
- Exploratory Study conducted by VS America

Anticipated ROI/benefits to the school and wider community

Example:

Rethink scheduling of the building – maximize utilization but looking at things differently (furniture helping to support but the impact can be felt more broadly...)

Post-Occupancy: Student Feedback

Student Quotes

"The rocking chairs, how comfortable they are play a decent role. Definitely harder to be engaged in the old building" **11th grader NFHS**

"I love the furniture in the hallways. Having those learning neighborhoods fostered an amazing environment for students to learn and enjoy each other's company." **12th grader NFHS**

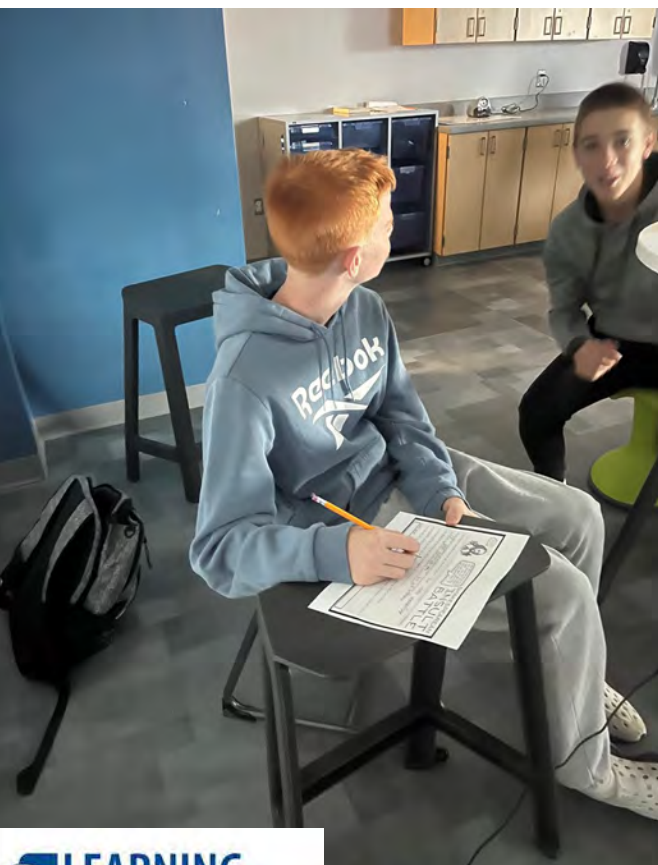


"Allows us to work nicely in groups, and be more engaged in group activities by being versatile and easily changed for any classroom environment" **10th grader NFHS**

"The chairs that move really help me hone in and focus because my body is also physically moving while my mind works." **10th grader NFHS**

"The higher tables in classrooms allow me to stand up while I do my work which keeps me engaged without distracting others." **11th grader NFHS**

"The huddle rooms bring a better workspace for me because there is less noise, and it gives me more of a chance to focus." **9th grader NFHS**



Post-Occupancy: Lessons Learned Over Year 1

Learning Neighborhoods: Benefits and Challenges

- How can we counter the “escape mentality”?
- What principles can we intentionally incorporate into how classrooms can be arranged?
- Can we bring some of the neighborhood back into the classroom?
- How can the neighborhoods benefit CTE as extension of the program?

Post-Occupancy: Lessons Learned Over Year 1

Faculty Workrooms: A Leadership Plan for Continued Growth

- Intentionally assigned workrooms to mix disciplines has fostered unexpected cross-curricular conversations.
- Departments exist more in time, not in place.

Post-Occupancy: Lessons Learned Over Year 1

How has the Building Adapted to CTE program Evolution

- Does location in the building help?
- How have the neighborhoods benefited CTE as extension of the program?
- What unexpected benefits have arisen from the new design to support the programs?
- How has the design met the Guiding Principles established at the beginning of the project?



Post-Occupancy: Career Technical Education Programs

2018 - 2019 Programs

- CAD/Architectural Design
- Video Production Lab
- Robotics, Engineering, Energy, & Transportation
- Stagecraft Manufacturing & Construction
- Culinary Arts and Hospitality
- Fashion and Costume Design
- Child Development
- Business & Marketing

2025 - 2026 Programs

- CAD/ Architectural Design
- Engineering Design
- Robotics Lab
- Intro to Programming
- Computer Science
- Digital Design
- Animation
- Digital Video Production & Broadcasting
- Woodworking & Construction
- Culinary Arts
- Fashion Design
- Interior Design
- Child Development
- Business, Marketing & Entrepreneurship
- Lifeguard Training
- Sports Nutrition
- Music Technology

Post-Occupancy: Vision for the Future

Exploring future Career Tech Trends and implementation into the curriculum

- Expanding upon current Theater and Drama classes to incorporate Sound and Lighting Design Electives
- Collaboration between Engineering and Robotics and Science curriculum
- Exploring AI and its impact on future careers

Thank You!

